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ABSTRACT

This study traces the implementation of broadcasting in the USSR and its growth through the mid-1920's. It covers the technological precursors and the political, economic, and administrative character of the emerging Soviet nation which provided the climate for that innovation. Lenin's contribution is considered in terms of his influence in the party and government, his impassioned belief in the necessity of technological progress, and the priorities he attached to communication with the proletariat and peasantry. (RB)

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THOMAS H. GUBACK and
STEVEN P. HILL

The Beginnings of Soviet Broadcasting and the Role of V. I. Lenin

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The Beginnings of Soviet Broadcasting and the Role of V. I. Lenin

THE INTRODUCTION of broadcasting in the Soviet Union shares two basic features with that in many other countries. First, the World War served to catalyze efforts to develop this medium by bringing together men with ideas who, driven by necessity, expanded and applied their knowledge. Military imperatives fostered wireless telegraphy and provided the rudimentary technological base from which wireless telephony could grow. This was particularly true in the case of Russia, whose physical isolation from allies during the war caused the country to turn to its own meager resources and to develop them.

Second, broadcasting was innovated in the Soviet Union at about the same time as elsewhere. In itself, this would not be startling were it not that the country had suffered from the World War, two revolutions in 1917, and then a Civil War in which American, British and French forces participated. Beyond that, industrialization had hardly taken hold, there were severe agricultural and economic problems, and the nation was tottering on the brink of collapse. Soviet scientists had not experienced the luxury of well-equipped laboratories and plentiful research funds. But at that stage of wireless development these amenities were probably of less import than today, for problems were still of a magnitude that was within the grasp of the individual inventor, working with instruments he often could fashion himself.

Yet these two broad similarities, as significant as they are, cannot conceal the equally evident fact that when broadcasting was introduced in the Soviet Union, it was in an environment which was at once *Russian* and *Bolshevik*.[1] Thus its evolution was shaped by the poverty of the country, notions of collectivism

[1] All Russian names are transliterated according to the Library of Congress system, with two simplifications in the English text: diacritics are omitted, and *ii* is shortened to *i*. (Bibliographic footnotes are not so simplified).

which proceeded both from Bolshevik doctrine and from the feudal past, the recognition that radio could be a social force for development, and, eventually, the five-year plans and the pragmatic priorities of Soviet industrial policy.

This study traces the innovation of broadcasting to the mid-1920s. It includes the technological precursors and the political, economic and administrative character of the emerging Soviet nation which provided the climate for that innovation. In so doing, it had to consider the contribution of V. I. Lenin (1870-1924), perhaps the only national leader of the time who saw in radio something more than a scientific novelty for popular amusement. His interest in it and his attention to the details of its introduction are striking. Lenin's position in the party and the government, his impassioned belief in the necessity of technological progress, the priorities he attached to communication with the proletariat and peasantry, all contributed to the individual contact he made with scientists and to his personal encouragement in party and government circles for support of wireless.

* * *

Late in 1917 the Bolsheviks took power in an industrially backward, almost medieval land. The task facing the new Soviet leaders, in addition to consolidating their regime, was to bring a large, culturally amorphous collectivity into a technological, machine-oriented Twentieth Century that would fulfill the promise of western development but display no economically exploitative propensities.

As Lenin assumed leadership of the country, he was confronted with a series of critical emergencies. Germany threatened invasion during the World War. Later, armed attacks by anti-Bolshevik forces and intervening foreign powers sought to overthrow the Soviet government. Japan pressured on the east while nationalist groups in Finland and the Ukraine sought autonomy and provoked miniature civil wars to realize their demands. In the financial sphere, complications of external trade, loans and debts were compounded by the reorganization and rehabilitation of manufacturing and agriculture. The need to develop totally new industries pin-pointed crises in manpower, transportation, raw materials and fuels. A long history of famine and epidemics

demanded immediate eradication of hunger and disease. The welding together of the new nation through a socialist communication policy faced inherent opposition due to illiteracy, lack of teachers and facilities, shortages of newsprint and efficient distribution methods—conditions which had become common features of life in Russia and elsewhere.

Against this backdrop, research had proceeded modestly into electricity and its manifold characteristics. The father of radio in the Soviet Union is considered to be A. S. Popov (1859-1905) who, in 1895, demonstrated a device for detecting electrical discharges in storms. Popov pointed out that if man could generate and control a similar kind of electrical disturbance, then a receiver could be developed to pick up intelligence transmitted without wires through space. Apparently Popov was able to do just that the following year when he sent the words "Heinrich Hertz" by wireless in code, but he seems to have been preceded in this feat by Marconi.[2] In any case, research of this nature does not seem to have been pursued with vigor in tsarist Russia; for example, the navy had to equip itself hastily with German apparatus at the beginning of the Russo-Japanese War. As in other countries, even through the time of the World War, wireless meant predominantly point-to-point telegraphy, and its development was spurred by military considerations.

Specialists in the navy had equipped the Baltic fleet and shore points with radiotelegraph apparatus of domestic manufacture. During the same period, in 1910, the Ministry of War began to establish a network of military stations which could communicate with naval shore units of the Baltic and Black Seas. By 1912 army signal units were provided field radiotelegraph stations produced by the Russian Wireless Telegraphs and Telephones Corporation. It had been founded in 1908 but remained Russian in name only, as the Marconi Company, seeking to maintain its

[2] See the important article by Charles Susskind, "Popov and the Beginnings of Radiotelegraphy," *Proceedings of the Institute of Radio Engineers*, Vol. 50, No. 10 (October, 1962), pp. 2036-47, as well as George A. Codding, Jr., *Broadcasting Without Barriers* (Paris: UNESCO, 1959), p. 12. A new publication treating wireless up to World War I is: I. V. Brenev, *Nachalo radiotekhniki v Rossii* ["The Beginning of Radio Engineering in Russia"] (Moscow: Soverskoe radio, 1970), 256 pp.

control over wireless, had acquired the majority of its stock by 1910. This followed a familiar pattern as other foreign interests had already organized factories in Russia to assemble equipment made elsewhere, a practice which took advantage of the country's manpower but contributed little scientific sophistication to it. Indeed, the Marconi Company's attempts to get a concession in Russia were said to have been promoted by the newspaper *Novoe Vremia*, which received in compensation a 50 per cent discount on telegrams and 50,000 rubles worth of stock in the corporation.[3]

In addition to the military network, which had not been completed by the outbreak of the War, there was a small system of 20 low-power stations operated by the Posts and Telegraphs Administration which provided only internal communication. International traffic was handled by foreign-based companies with offices in Russia. In fact, at the time of the War, the few radiotelegraph stations in Russia placed it almost last among European countries with such facilities. When war broke out, contact with western Europe via cable and radio was disrupted, forcing Russian engineers to turn to their own scant resources. The Russian Wireless Telegraphs and Telephones Corporation quickly built transmitters which were installed by the end of 1914 on Khodynka Street (west side of Moscow) and in Tsarskoe Selo (now Pushkin) near Petrograd—two locations which were to become important in the history of wireless in Russia.[4] In addition, a receiving

[3] V. I. Lenin, "Kapitalizm i pechat' " ["Capitalism and the Press"], *Polnoe sobranie sochinenii* ["Complete Works"] (Moscow: Izdatel'stvo Politicheskoi literatury, 1958+), Vol. 25, pp. 5-8. Also available in V. I. Lenin, *Collected Works* (London: Lawrence and Wishart [Moscow: Foreign Languages Publishing House, and Progress Publishers, 1960+]), Vol. 20, pp. 162-5. All quotations from Russian sources (except Trotski) have been translated from the Russian originals by S. P. Hill. Hence they do not necessarily coincide with the (often inexact) versions in English translations, such as Lenin's *Collected Works* in 45 volumes cited above. But for those who read only English, citations from Lenin's newly-published *Polnoe sobranie sochinenii* in 55 volumes (hereafter, *PSS*) will include whenever possible a cross-reference to the English-language *Collected Works* (hereafter, *CW*).

[4] The first experiments in radiotelephony had been conducted at the beginning of the war by N. D. Papaleksi and S. M. Aizenshtein over a distance of about 20 miles between Petrograd and Tsarskoe Selo. See M. A. Bonch-Bruevich, *Sobranie trudov* ["Collected Works"] (Moscow: Akademiia nauk, 1956), p. 241.

station was constructed 100 miles northwest of Moscow, at Tver (now Kalinin), along with several coastal intercepter stations to monitor signals from German naval movements. Meanwhile, the navy's electrical factory had produced a number of field stations of the crystal type, then the dominant kind of radio equipment, the few tube sets available being of French and American design.

'Loudspeaker of the Revolution'

Thus, when in 1917 the February Revolution exploded on a country already disintegrating under the pressures of war, an embryonic foundation had been established for eventual electrical communication systems. Radiotelegraphy was a known and practiced art, crude manufacturing facilities existed, and a small cadre of operators, tinkerers and engineers had gained experience. When the Bolsheviks came to power in October, wireless telegraph was used often and a station became a prized military target as a palace or capital buildings had been before. Kerenski's anti-Soviet forces had captured the Tsarskoe Selo station in late October; the Bolsheviks, however, had seized Moscow's Khodynka installation and also controlled the New Holland station at the Petrograd army post, from which Lenin telegraphed military units on November 22 announcing the dismissal of Commander-in-Chief N. N. Dukhonin (1876-1917). At that time, Lenin was aware that "our wireless messages are reaching Europe." One of them, "our wireless message about the victory over Kerenski," as Lenin reported to the All-Russian Central Executive Committee, "was picked up by the Austrian wireless telegraph and relayed," while the "Germans, on the other hand, sent out jamming signals to block it." He considered the fact that "We can contact Paris by wireless" extremely important for notifying the French people about a European armistice and peace treaty.[5]

When the new government moved to Moscow early in 1918, the work load expanded greatly for the Khodynka station. This primary outlet became known as "the loudspeaker of the Revolution," and on November 7, 1922, it was officially named the October Radio Station. At the beginning of 1918 it was transmitting around 20,000 words a month, but a year later that had

[5] Lenin, *PSS* 35:85-8; CW 26:315-18.

jumped to 130,000, even though the key was hand-operated and speed was not greater than 10 or 12 words a minute. The station was able to operate on wave lengths of 5000, 7000, and 9000 meters (60, 43, and 33.3 Khz).[6] So important was the installation considered to be that in December, 1918, in the midst of severe famine, its employees were allotted the relatively generous soldier's ration, while a special decree provided fuel and lubricants for the station's diesel generators at a time when oil resources of the Caucasus and Baku regions were inaccessible to the Soviets. Service had to be suspended for several days in May, 1920, when anti-Bolshevik ("White Guard") saboteurs blew up an ammunition warehouse near the station, crippling its antennas and damaging much electrical equipment. Lenin quickly approved a decree of the Cabinet[7] creating a special commission to restore operations.

Aside from domestic service, the Khodynka station provided the Soviet government with international connections. Operators there, as well as at the Tver and Tsarskoe Selo stations, monitored transmissions from Europe which kept the government abreast of world developments and helped to overcome the effects of the blockade during the Civil War. In March, 1919, for example, the Khodynka station picked up messages about the Communist revolution in Hungary. Lenin was able to send an enthusiastic note of congratulations to the new Hungarian government and declared that "Regular radio communication between Budapest and Moscow is absolutely necessary."[8] The uprising seemed all the more decisive at the time as the fate of the Russian revolution was thought to hang on similar proletarian seizures of power throughout Europe.

[6] V. I. Shamshur, *Pervye gody sovetskoi radiotekhniki* ["The First Years of Soviet Radio Engineering"] (Moscow: Znanie, 1969), p. 20 (hereafter, *Pervye gody*). Shamshur is one of the oldest radio journalists in the Soviet Union. He began writing *Izvestia's* "Radio Corner" in 1925.

[7] In this monograph the term "Cabinet" is used to translate the early Soviet term *Sovet narodnykh komissarov* or *Sovnarkom* (literally, "Council of People's Commissars"), which was then the Soviet Union's ruling body, with wide executive powers and unlimited legislative authority. Chairing the Cabinet was Lenin's official position. "Ministry" is used here to translate the term *narodnyi komissariat* or *narkomat* (literally, "people's commissariat"), eleven of which made up the Cabinet at that time.

[8] Lenin, *PSS* 38:216; *CW* 29:226.

Telegraphic communication underwent a major reorganization in 1918 which was to prove important for radiotelephone and broadcasting developments in the years immediately following. It was largely prompted by the vulnerability of wire lines to anti-Bolshevik sabotage and the scarcity of equipment for non-military use. At the beginning of the World War, all high-power stations, as well as spare equipment, had been brought under the control of the Ministry of War. Later, the few low-power stations remaining in the network operated by the Ministry of Posts and Telegraphs gradually became swamped by the increasing demands placed upon them by the revolutionary government. As part of the reshuffling, V. N. Podbelski (1887-1920), journalist and agitator, was appointed Minister of Posts and Telegraphs in April, 1918. At the same time, the Cabinet considered transferring a number of powerful transmitting stations, and eventually all fixed stations, from the military to Posts and Telegraphs, a move supported by the Second All-Russian Congress of Radio Specialists meeting in Moscow in June, but opposed, of course, by the army.[9] The project was finally carried out on July 21, 1918, by the Cabinet's decree on the centralization of radio engineering, the first Soviet document on wireless. In addition to defining the relation of various ministries to radiotelegraphy, it created a Radio Engineering Council within Posts and Telegraphs, shifted important spark-gap transmitters and warehouses to that Ministry, and gave it wide authority to develop and construct radio facilities. A. M. Nikolaev (1887-1937) was appointed chairman of the Council.

Like many other Bolsheviks, Nikolaev had spent a good deal of time in exile, and had met Lenin in Switzerland. He had been graduated in 1913 from Toulouse University in France with a major in electro-mechanics, and had worked in that country assembling and testing radio equipment. Thus, to qualify him for his post, he had a considerable technical background and the right political credentials. The latter apparently were not sufficient to save him from the Stalin purges, an error acknowledged by Nikolaev's posthumous rehabilitation in 1957. Two of his

[9] B. A. Ostroumov, *Nizhegorodskie pionery sovetskoi radiotekhniki* ["Nizhni-Novgorod Pioneers of Soviet Radio Engineering"] (Moscow-Leningrad: Nauka, 1966), p. 155.

classmates at Toulouse had been V. S. Dovgalevski (1885-1934), who was Minister of Posts and Telegraphs from 1921 to 1923, the critical period in the innovation of Soviet broadcasting, and G. V. Putiatin (1883-1942), who started working at the Tver installation in 1916.

In May or June, Nikolaev visited the facilities at Tver and discovered a small, unofficial laboratory and workshop run by M. A. Bonch-Bruevich (1888-1940), who had come to the hastily constructed station in 1914 as assistant chief. Bonch-Bruevich had been trained at a military engineering academy where one of his teachers had been V. K. Lebedinski (1868-1937), a former student of Popov as well as author of the first Russian textbook on wireless telegraphy, and after 1918 a member of the Radio Engineering Council. Upon his graduation in 1909, Bonch-Bruevich was assigned to a signal unit, then spent some time in Germany, and attended the Officers Electrical Engineering School prior to the outbreak of war. At the Tver station, he began to experiment with making tubes, as the war largely had cut off Russia's external sources, but he had to do this on his own initiative because some military authorities felt tubes lacked the ruggedness needed for mobile units. In 1915, he succeeded in producing his first models. Although amateurish and hand-assembled under primitive conditions, they apparently were cheaper and lasted longer than those manufactured by the Russian Wireless Telegraphs and Telephones Corporation and permitted amplified reception of foreign signals. Bonch-Bruevich was encouraged in his work by a new commander (also a former student of Lebedinski), V. M. Leshchinski (1887-1919), who arranged for him to make a two-and-a-half month visit to France, via Scandinavia and England, early in 1916 to study basic tube technology. Upon Bonch-Bruevich's return, Leshchinski persuaded Professor Lebedinski to join the research work at the Tver station and then augmented its technical equipment and personnel. The same year, the team started making vacuum tubes and receiving sets, but a fuel shortage late in 1917 interrupted the work.

It was this miniature research and manufacturing set-up which Nikolaev found during his visit, and it impressed him so much that he returned with Podbelski. Discussions followed about further development of on-going projects, one of which apparently

involved radiotelephony, an art not enthusiastically endorsed by the military because a transmission could not be coded. Based upon these talks, Leshchinski, with the assistance of Bonch-Bruevich and Lebedinski, presented a report to the Ministry early in June of 1918 which identified problems in the future of wireless and offered a draft decree recommending establishment of a formal research unit with special equipment, qualified personnel and a budget. The board of the Ministry approved the decree the same month, thereby ratifying the operation at Tver and confirming Leshchinski as its head. On the staff was P. A. Ostriakov (1887-1952), who had been a student with Bonch-Bruevich before the war and had worked on radio equipment for aircraft. A few years hence he would be in charge of building Moscow's first broadcasting station.

It was decided to move activities away from the war zone as the Germans were threatening in the west, and to a location where continuous electric power was assured. Nizhni-Novgorod (now Gorki), about 150 miles east of Moscow, was selected as the site. It was a major transportation hub and, probably because of its important industries, a principal Bolshevik stronghold. During that summer of 1918, the Cheka had secured the city from internal threat by arresting a White Guard organization and executing part of it.[10] In August, just before Lenin was wounded by a would-be assassin, the 18 researchers and their apparatus left Tver and reached Nizhni-Novgorod. It is significant that this group, some of whose members had known each other for a decade, included most of those who would be responsible for innovating broadcasting in the Soviet Union. Later, in November, Lenin sent telegrams to military and civilian agencies in the city insuring that the scientists received soldiers' food rations and that sufficient materials were at their disposal. The set-up had proceeded quickly as the Laboratory achieved an immediate goal of starting receiver amplifying tube production before the Revolution's first anniversary.

[10] Edward H. Carr, *The Bolshevik Revolution* (Baltimore: Penguin Books, 1966), Vol. I, p. 174. "Cheka" is an abbreviation of All-Russian Extraordinary Commission to Combat Counter-Revolution and Sabotage, sometimes referred to as "Political Police."

The functions and responsibilities of the new organization were spelled out in the December 2, 1918, decree of the Cabinet. The Laboratory and workshop were to be the center of all scientific work in radiotelegraphy and radiotelephony, as well as in related areas of the physical sciences. (Indeed, by 1920, the Laboratory had a staff of about 200, including the original group from Tver, one from the Petrograd Decas factory, and another from Tsarskoe Selo.) The unit was to produce radio apparatus for its own use and for other government divisions, and was to maintain technical supervision of all radio equipment of the Ministry of Posts and Telegraphs. Also within its responsibilities were the preparation of technical books and articles, as well as the founding of a Radio Engineering Institute. Eventually the Laboratory began publishing activities when, in 1919, the journal *Telegrafia i telefonia bez provodov* ("Telegraphy and Telephony Without Wires"), edited by Lebedinski, was transferred there from Moscow. Among the Laboratory's immediate assignments, however, were the monthly production of 3,000 vacuum tubes, the designing of a standardized receiving station for Posts and Telegraphs and the development of long-range radiotelegraph transmitters.[11] The last task was subsequently expanded by the July 30, 1919, decree of the Council for Labor and Defense (CLD), an agency then concerned with mobilizing manpower for civilian work. It charged the Ministry of Posts and Telegraphs, and thus its Laboratory, with building in Moscow a new model station to provide regular telegraphic communication with outlying regions as well as the Western countries. Shabolovka Street (south side of Moscow, eventually the site of the television center) was chosen as the location, and when the station began operating it relieved the Khodynka transmitter of much of the pressure on it. Later, on July 21, 1920, the CLD approved a measure outlining a plan for constructing a number of radiotelegraph stations and reorganizing several existing ones, including that on Khodynka, by installing powerful transmitters of the high frequency machine[12] type developed by V. P. Vologdin (1881-1953). At that time, as the Civil War was coming to an end, the state of telegraphy was such that more than 60 per cent of

[11] Shamshur, *Pervye gody*, pp. 32-3.

[12] A high-speed rotary spark-gap transmitter with multiple electrodes, an example being the Alexanderson alternator.

property and equipment was in an inoperative condition or wrecked.[13]

"Newspaper Without Paper"

Lenin's enthusiasm for modernizing life through the application of electricity parallels his attention to the potentials of radio. From January, 1920, his writings reveal considerable interest in a study prepared by G. M. Krzhizhanovski (1872-1959) on electrification of industry. They stress the need to mobilize popular support for making "all Russia, both industrial and agricultural, *electrical*."[14] By the end of the year, he had heartily endorsed Krzhizhanovski's report to the Eighth All-Russian Congress of Soviets. During the same period, there becomes apparent the development of Lenin's fundamental concern for innovation of broadcasting by coupling a loudspeaker to the wireless telephone, a method both reasonable and logical for the time. Already familiar with the marvels of the wireless telegraph and convinced of its great worth, Lenin believed it to be absolutely essential that communication facilities be extended with the radiotelephone so that many could simultaneously hear a message or announcement.

It appears the earliest written expression of these convictions is contained in a note Lenin wrote on February 5, 1920, in response to Bonch-Bruevich's complaints over difficulties at the Laboratory, particularly the arrest of its acting director, A. F. Shorin (1890-1941), a former tsarist officer. Following a briefing by Nikolaev and inquiries made of F. E. Dzerzhinski (1877-1926), chairman of the Cheka, Lenin was persuaded and sent telegrams ordering the immediate parole of Shorin while the investigation continued and straightening out other difficulties with the Nizhni-Novgorod City Council. The same day, Lenin addressed the short note to Bonch-Bruevich explaining the action taken and closing with this paragraph:

> I take this opportunity to express to you my profound gratitude and sympathy with regard to the great work of radio inventions which you are doing. The newspaper without paper and "without distances"

[13] B. S. Sotin, *Ocherki istorii radiotekhniki* ["Essays on the History of Radio Engineering"] (Moscow: Akademiia nauk, 1960), p. 391.

[14] Lenin, *PSS* 40:63; *CW* 35:435.

which you are creating will be a great thing. I promise to give you any and every assistance in this and similar projects.[15]

This seems to be the beginning of Lenin's admiration of Bonch-Bruevich, who was later to be referred to by Lenin as a "*very outstanding*" inventor.[16] As subsequent events and correspondence demonstrate, the pledge of help was tested repeatedly in the two years following.

Research at the Nizhni-Novgorod Laboratory had reached the state at which a small experimental radiotelephone transmitter was assembled there using water-cooled tubes developed by Bonch-Bruevich.[17] This seemed to be the proper path of development, as tests of high frequency machine transmitters had indicated they were not entirely satisfactory for speech but were quite adequate for telegraphy. Moreover, water-cooling seemed a solution for the great heat necessarily produced in the generating of high-power signals. Beginning in January 1920, test transmissions of voice were made whose reception was confirmed by reports from (often startled) monitors in various parts of the country.[18]

[15] Lenin, *PSS* 51:130; *CW* 35:137. The origin of the curious phrase "newspaper without paper and 'without distances'" is clouded. Bonch-Bruevich (*op. cit.*, p. 243) points out that "prior to 1919, the idea of broadcasting as we now understand it essentially did not yet exist in our country." He adds: "For the first time the idea of broadcasting was formulated by V. I. Lenin in his famous letter" of February, 1920. However, aside from this testimonial, there is no convincing evidence to suggest the term—or the notion of an oral newspaper—originated with Lenin. The text of Bonch-Bruevich's letter which made its way to Lenin is apparently unpublished (or lost); no citations are made from it in the extensive scholarly apparatus in *PSS* (see 51:407). It could be these ideas originated with Bonch-Bruevich himself and that his attributing them to Lenin is a case of modest deference.

[16] Lenin, *PSS* 52:54; *CW* 45:473. Original emphasis.

[17] Water-cooled tubes were also in the experimental stage in the United States about this time. Banning reports that "after the war" research was begun to develop high-power transmitter tubes with water cooling and that a "powerful water-cooled amplifier" was installed in 1922 at an R.C.A. transatlantic station. It was successfully tested with voice transmissions from New York to London in January, 1923. See William P. Banning, *Commercial Broadcasting Pioneer* (Cambridge: Harvard University Press, 1946), pp. 124-5.

[18] Bonch-Bruevich, *op. cit.*, p. 242; and untitled excerpts from P. A. Ostriakov's book, *Mikhail Aleksandrovich Bonch-Bruevich* (Moscow: 1953) as reprinted in *Vospominaniia o V. I. Lenine* ["Reminiscences About V. I. Lenin"] (Moscow: Izdatel'stvo Politicheskoi literatury, 1970), Vol. 4, p. 162 (hereafter, *Vospominaniia*).

Nikolaev conveyed these encouraging results to Lenin, who instructed the Ministry of Posts and Telegraphs to draft a decree for the CEC on the subject of radio-telephones.[19] Official encouragement of research was thereby provided when Lenin signed the measure March 17, 1920. Perhaps mirroring over-confidence in experimental progress or reflecting a belief that a deadline stimulates productivity, it charged the Laboratory with setting up "in the shortest possible time, not more than two-and-a-half months, a Central Radiotelephonic Station with a service radius of two thousand versts,"[20]—about 1,300 miles, a substantial requirement for that time. Moscow was designated as its location, and on April 29 a branch of the Laboratory was established there to begin the work.

One can speculate about the feasibility of this optimistic deadline and whether it was set by administrators without clear understanding of practical engineering problems. Apparently it was not considered unreasonable to some of those involved, for five days after approving the decree Lenin visited Moscow's Khodynka installation, where he heard a radiotelephone transmission with good clarity for Nizhni-Novgorod.[21] That was but a distance of 150 miles or so, and while great obstacles clearly stood in the path of high-power output, they did not seem insurmountable. Researchers had the new water-cooled tube at their disposal, and in spite of harsh economic conditions and severe material shortages, this was believed to be the answer to the challenge. Yet seemingly lost to consideration was the equally evident fact that the transmitter had to be supplied with a power source, towers for the antenna, and water connections for tube cooling—all of which already existed at Khodynka and Nizhni-Novgorod. Nonetheless,

[19] At about this time, Lenin was outraged at breakdowns in his own long-distance wire telephone connections. Twice in mid-February Lenin attempted to make crucial calls to I. V. (Joseph) Stalin (1879-1953), who then headed the Bolshevik military occupation at Kharkov on the southwestern front, but he had difficulty hearing Stalin, and Stalin claimed he was totally unable to hear Lenin. Nikolaev's subordinate in charge of telephones, G. L. Vollenberg (1890-1940), was sent a sharp reprimand (and threat of arrest) by Lenin for these and other failures in Lenin's private phones—which on occasion even affected local and suburban calls between the Kremlin and Lenin's country retreat. See *PSS* 51:134, 136-7, 212-13.

[20] Lenin, *PSS* 45:549-50.

[21] Shamshur, *Pervye gody*, p. 37.

it was patently clear that wireless telegraphy could span thousands of miles—so why not speech in due time? A pertinent commentary on this period was expressed by L. D. Trotski (1879-1940) four years later:

> It is true that the War has produced a long series of technical inventions. But the poverty which it has produced has put off the practical application of these inventions for a long time and with this their possibility of revolutionizing life. This refers to radio, to aviation, and to many mechanical discoveries.[22]

Unfortunately, progress was slower than anticipated. On June 25, 1920, quite beyond the deadline, Lenin asked the Ministry of Posts and Telegraphs when the radiotelephone would be ready for use and inquired about the status of loudspeaker construction. He was informed that the first official radiotelephone conversation was planned to be with Berlin and that speaker research was proceeding. However, it was not until December that the experimental transmitter used at Nizhni-Novgorod was brought to Moscow for installation at the Khodynka station where antenna masts and a power supply existed. The delay might have been caused by Bonch-Bruevich's making new model tubes which raised the transmitter power to 5 kilowatts. But it is more likely that shortages of electricity slowed the work.

During the autumn of 1920 there were repeated power interruptions because the Nizhni-Novgorod city power station, which supplied current to the Laboratory, lacked sufficient fuel (a problem of crisis proportions which gripped the entire country). Moreover, a Petrograd plant which produced compressed gas for the Laboratory also shut down for want of fuel, and construction of the Laboratory's own electric source had to be halted mid-way when funds ran out. Ostriakov, head of station construction at the Laboratory's Moscow branch, was frustrated in his search for financing and in desperation wrote directly to Lenin. On November 16, Lenin summoned him for a conference and after listening to the engineer, telephoned the Ministry of Finance and the monetary question was settled quickly. It is pertinent to note that

[22] L. D. Trotski, *Literature and Revolution* (Ann Arbor: The University of Michigan Press, 1960), p. 189.

during this same period, Lenin was extremely concerned about hastening electrification of Russia. As he had observed the previous month, "Communist society . . . cannot be built unless we restore industry and agriculture . . . on a modern basis, in accordance with the last word in science. You know that electricity is that basis."[23] Certainly in acting upon Ostriakov's request, he was contributing not only to electrification, but to "radiofication."

In the meantime, Nikolaev had arrived in Berlin and on December 16 a transmission from Moscow was brought in by indoor antenna with such clarity that he was able to identify by voice timbre the names of people speaking over the air. Reception at 1,000 miles, besides astounding Telefunken engineers who were unable to make a return transmission until March, 1921,[24] seemed to bring much closer the goal of a permanent high-power Moscow station. The experimental transmitter, which used tubes developed by Bonch-Bruevich, remained installed at Khodynka for additional tests and eventually one of the researchers took on the added duty of announcer. As the few listeners in those days were strictly technicians and monitors at other Ministry stations, his copy consisted of articles from the journal published at the Laboratory.

The encouraging results of December would have come sooner, it appeared, if smooth functioning of official machinery and sufficient materials and funding had existed. Lenin certainly was aware of this for on January 26, 1921, Ostriakov forwarded to him a detailed proposal for establishing a radio-telephone network, as well as a summary of difficulties encountered in setting up the Moscow station (actual construction of a new building to house it had begun in October, 1920). The obstacles may have been of a non-technical nature—administrative or political—because Lenin was called upon to use his influence to remove them. The same day, Lenin forwarded a decree with his personal endorsement to N. P. Gorbunov (1892-1938), secretary of the executive committee of the Cabinet, asking him to "follow up this matter," to discuss it with Ostriakov, and also to contact the

[23] Lenin, "Zadachi soiuzov molodezhi" ["The Tasks of the Youth Leagues"], *PSS* 41:307; *CW* 31:289.

[24] Shamshur, *Pervye gody*, p. 39.

Radio Laboratory. Gorbunov was instructed "to get the attached draft decree *speedily* through the executive committee," but if unanimity could not be reached, then to bring it up at a meeting of the full Cabinet. Lenin asked to be kept informed "twice a month on the *progress* of the projects"—a choice of word and emphasis which served as a forceful hint. The note to Gorbunov also is of interest because Lenin points out how the broadcasting system is to be employed:

> The matter is *of gigantic importance* (a newspaper without paper and without wires, for with a loudspeaker and with the receiver which Bonch-Bruevich has developed in such a way that we will easily get *hundreds* of receivers, all Russia will hear a newspaper read in Moscow.)[25] [Original emphasis]

"*We Are Paupers*"

The following day, January 27, 1921, the measure was approved and then signed by Lenin. Apparently referring to the experimental transmissions from Khodynka, it acknowledged the success of the Radio Laboratory in carrying out the CLD's decree of March 17 of the previous year. The Ministry of Posts and Telegraphs was now charged with an ambitious program of *constructing* a two-way radiotelephone *system* which would unite a central station in Moscow (to be built within six months) with the more important areas of the country. The Laboratory, heretofore mostly concerned with research, was assigned the production of transmitters and receivers, while Gorbunov was personally charged with checking progress of the whole plan. The decree stressed the exceptional urgency of the scheme.[26] (About three weeks later, February 18, and almost as an addendum to the decree, Lenin signed a special authorization card for Ostriakov who was directing construction of the Moscow station. This credential, which Lenin had directed him to draft when they met in November, gave wide authority to Ostriakov, serving both as scissors to cut red tape

[25] Lenin, *PSS* 52:54; *CW* 35:473.

[26] Shamshur, *Pervye gody*, pp. 40-41; *Vospominaniia* 4:165; A. M. Nikolaev, *Lenin i radio* ["Lenin and Radio"], second edition (Moscow: Izdatel'stvo Politicheskoi literatury, 1958), pp. 30-31.

and warrant to procure materials.)[27] But beyond its many details and assignments of tasks, the decree of January 27 implicitly represented a large step forward—from the stage of isolated experimental transmissions to an operational interconnected loudspeaking radiotelephone system.

The dispatch with which the Ostriakov memorandum was handled, the sense of urgency surrounding the innovation of broadcasting, as well as the stress on radio reports of news, are accounted for in no small measure by Lenin's attitudes toward newspaper distribution in Russia. Less than two weeks later (February 9), they appeared in a *Pravda* article, "The Functioning of the Ministry of Education." In it, Lenin explains that "there are 350,000 copies of *Izvestia* and 250,000 of *Pravda* for the whole of Russia. We are paupers. We have no newsprint." He urges more efficient distribution and outdoor posting of papers, saying that 350,000 copies of both would suffice, rather than the 600,000 "which are being grabbed by the 'Soviet bureaucrats,' wasted as 'cigarette paper,' etc., simply by force of capitalistic habits." A saving of 250,000 copies, Lenin writes, would be equal to "*two* dailies with a circulation of 125,000 each. And each of these every day could give the people serious and valuable literary material, the best and classical [*sic*] fiction, general education textbooks, textbooks on agriculture and textbooks on industry."[28] In this context, certainly, the prospect of a "newspaper without paper" appears a tenable, if not miraculous, solution to shortages and inefficiency.

It is evident, however, that bureaucratic ineptness and other sources of delay existed in newspaper distribution and radio development alike. It is also evident that it was not just a simple matter of innovating broadcasting *per se*, but equally one of creating along with it, if not as a pre-condition for it, whole new industrial sectors, albeit on a small scale. In the parallel movement toward electrification, it meant starting new factories to manu-

[27] Ostriakov was "authorized to use all resources available" to complete the project, while factory managements were directed to render whatever assistance was needed. Further, Ostriakov was to report "all obstacles" to the work. A photograph of the document appears in Bonch-Bruevich, *op. cit.*, p. 246.

[28] *Pravda*, February 9, 1921, p. 3; Lenin, *PSS* 422:330-31; *CW* 32:131-2.

facture light bulbs, organizing production and treatment of poles, founding ceramics works to make insulators, inaugurating courses to teach an almost illiterate population what electricity was all about, and tapping all sources of raw materials, even (as Lenin wrote to Krzhizhanovski) church bells and door handles for copper.[29] In any case, by April, 1921, the Moscow station, or broadcasting in general, did not seem close enough to innovation to warrant Lenin's including it in a letter mentioning media to be used to promote peat production (leaflets, pamphlets, travelling exhibitions, motion pictures, textbooks and a required college course).[30]

Meanwhile, engineers Dikarev and Chistovski, working at the Kazan military base's radio laboratory, had successfully constructed tube amplifiers to strengthen the signal of telephone transmissions, so that the voice at the receiving end of hand sets was very strong. The next logical step was adapting the amplifier to drive a loudspeaker and on May 1, 1921, a thousand people in Kazan witnessed a demonstration of two such outdoor speakers connected to the amplifier by a telephone line, over which news dispatches were read.[31] Lenin noticed an article about this in the May 7 newspapers and immediately wrote Gorbunov to check the story with Ostriakov and "If it's true, they [speakers] need to be installed in Moscow and St. Petersburg."[32] Lenin also took the opportunity to ask for a written report on progress of receiver and speaker production, and on the construction timetable for the Moscow station itself.

The Dikarev-Chistovski amplifiers were sent to Moscow, where similar tests were run between May 28 and June 1. These, as well as the Gorbunov report, undoubtedly served as the basis for a decree, approved June 3 by the CLD, which charged the Radio Laboratory's Moscow staff with installation of outdoor speakers in that city and transmission of an oral newspaper. This was accomplished two weeks later when news from the ROSTA agency (the forerunner of TASS) was transmitted from speakers in six important locations around Moscow.[33] The speakers were connected directly to the transmission point by cable, and the

[29] Lenin, *PSS* 52:38; *CW* 35:469.
[30] Lenin, *PSS* 52:136-7; *CW* 35:484.
[31] *Pravda*, May 7, 1921, p. 2.
[32] Lenin, *PSS* 53:159-60.
[33] Shamshur, *Pervye gody*, p. 43.

system consisted literally of loud-speaking telephones. Thus it represented an early use of wire distribution and was a predecessor of later diffusion networks. Clearly, the notion of "broadcasting" at this time was not confined to wireless transmission. It would seem in retrospect that the Moscow organization actually had two functions which probably were not considered independent at the time: a powerful radio station transmitting to receiving stations around the country, and also the source for the distribution network in Moscow itself.

"To Everyone, to Everyone"

Although the oral newspaper was new, outdoor reporting of events was not. Indeed, the projected net of radio stations was an attempt to do for voice transmission what had already been accomplished in telegraphy. In 1918, the Ministry of Posts and Telegraphs began organizing a large network of radiotelegraph stations, some of which had just been transferred to it from the military, while others had to be pieced together from surplus army gear and whatever civilian equipment existed. During the Civil War when Russia was cut off from Europe, operators in stations at Tver, Tsarskoe Selo and Khodynka (before the time of the radiotelephone transmitter there) picked up telegraphic reports of European stations and relayed them to each other, addressed simply "To everyone, to everyone." These became the hand-written news sheets posted in town squares, railway stations, store windows, etc., and occasionally issued as leaflets. By 1919, the Khodynka station in Moscow often was handling more than 1,000 words daily of such news reports. At the end of 1918, there were stations in 80 locations on the circular route for the bulletins, and in 1920 the number had reached 222.[34] With the shortage of newsprint, the telegraphic summaries proved an economic means of public information, while the reliance upon radio made counter-revolutionary attacks on wire lines less telling in their effect.

The innovation of something similar via the radiotelephone seemed convincingly logical and utterly practical in 1921, and likely to occur any day, if one had faith in a series of trials and experiments. But the jump from a test to an operational system

[34] Shamshur, *Pervye gody*, p. 23.

is large, and one cannot always be sure just how many hurdles stand in between. Apparently Lenin was growing impatient with what to him reflected a lack of efficiency and was puzzled by the inability of engineers to put into conclusive operation something which already had been tested successfully. No doubt this was the basis on September 2 for his terse, blistering inquiry to Dovgalevski, the new Minister of Posts and Telegraphs, with an information copy to Gorbunov (who had been charged eight months earlier with keeping Lenin informed about the radio project). In part, it reflects Lenin's concern about the tense, complex situation in the east which involved more menacing gestures by Japan, the security of Soviet borders in the area, the Far Eastern Republic, and the Washington conference on Pacific affairs convened by the Great Powers.

Repeating questions posed months before, Lenin asks specifically if the Moscow station is operating, and if so, for how many hours each day and over what distance, and "If not, what is lacking?" He also demands information on the manufacture and operation of receivers and, with clear reference to the wire distribution system, wants to know "How do matters stand with loudspeakers, the apparatus which enables a whole auditorium [or square] to listen to Moscow?" In one sense, Lenin's pointed questions appear rhetorical because his letter hints he anticipates negative answers:

> I am very much afraid that this matter has once again 'gone to sleep' (in the damned habit of Russian Oblomovs,[35] of putting everyone and everything to *sleep*).
>
> It has been 'promised' many times, and all the deadlines have expired long ago!
>
> The importance of this matter for use (for propaganda in the East especially) is *exceptional*. Delay and negligence here are criminal. [Original emphasis]

Lenin reminds his addressees that "All this already exists abroad" and, perhaps reflecting a sense of futility produced by incomprehensible delays, asserts that "what is lacking can and must be bought." He ends the note with a stern, accountability-provoking declaration: "In all probability, there is criminal negligence

[35] Oblomov, a landowner in Goncharov's novel, was the laziest and most inert character in 19th century Russian literature.

somewhere."[36] Clearly, Lenin is vexed by the failure to introduce broadcasting and the slow progress in preparing apparatus. The inability of subordinates to meet crucial deadlines is as unnerving to him as to any leader, political or industrial. Add to this similar conditions in other fields and one has a picture of despair, a sense of hopelessness before monumental crises on whose immediate solutions the fate of the nation, and the first socialist revolution, hang.[37]

Lenin's disgust with organizational nonsense and the snail-paced grinding of ill-meshing gears of officialdom appears repeatedly in his correspondence as he tries not only to coax a lethargic country into modern efficiency, but to keep it together from one day to the next. Complicating the matter is the growing complexity of an industrializing nation, yielding a situation in which a slowing of production in one sector has progressive and cumulative effects on numerous others. Lenin's impatience with slow-motion bu-

[36] Lenin, *PSS* 53:160-61; *CW* 35:519-20. Subsequently, at Lenin's direction, a commission investigated the delay. On the basis of its report, the Cabinet on November 9, 1921, officially reprimanded P. A. Bogdanov (1882-1939), chairman of the Supreme Council of the National Economy, for its failure to supply certain quantities of compressed gas and glass to the Radio Laboratory. At the same time, Ostriakov was reprimanded for not having met a six-month deadline imposed by Lenin in the January 27 (1921) decree on construction of the Moscow radiotelephone station. See *Vospominaniia* 4:165, 169; Nikolaev, *op. cit.*, pp. 31, 32; V. I. Shamshur, *Lenin i razvitie radio* ["Lenin and the Development of Radio"] (Moscow: Sviaz'izdat, 1960), pp. 143, 144 (hereafter, *Lenin*).

[37] Another of Lenin's disappointments, especially bizarre, involved S. I. Botin, who alleged in 1920 that he had invented a means of exploding gunpowder by wireless. This claim won him Lenin's unswerving patronage, over the protests of both Ostriakov and Nikolaev. Lenin allowed Botin to carry on his top-secret research in private, well-financed facilities, first at Nizhni-Novgorod, then at Bogorodsk (now Noginsk), from mid-1920 until October, 1921, when a three-man review commission finally convinced Lenin that the scheme was hopeless and should be abandoned. See *Vospominaniia* 4:167-8, 203-4; *PSS* 53:113. Lenin's considerable enthusiasm was obviously spurred by the military applications of radio-induced explosions, a potential felt urgently during the wars on the Polish and Crimean fronts in 1920. In one of his two "top secret" notes to Botin himself, written June 4 at a critical juncture in the fighting, Lenin urges the inventor to move up the date of scheduled test firings so that Lenin would be able to use that knowledge at a pivotal CLD strategy session, otherwise "we might lose *many thousand extra* soldiers." See *PSS* 51:209-10; *CW* 44:384.

reaucracy and the lack of performance supervision is especially visible in a long letter of January 24, 1922, to A. D. Tsiurupa (1870-1928), newly-appointed Deputy Chairman of the Cabinet. A friend of Lenin for more than 20 years, Tsiurupa was to function rather as an efficiency expert and administrative trouble-shooter. Lenin writes:

> . . . we need to have a detailed talk on the whole system of operations, and think it over 'real good' [*sic*].
>
> The most radical defect of the Cabinet and the CLD is the absence of any check-up on performance. *We are being pulled down* by the foul bureaucratic swamp into writing papers, talking about decrees, writing decrees—and in this sea of paper live work is being drowned. . . .
>
> The center of gravity of your operations must be just this reworking of our disgustingly bureaucratic operations, a struggle against bureaucracy and red tape, a *check-up on performance*.
>
> . . . we have what amounts to complete irresponsibility at the top, in the ministries and in their departments, and saboteurs are making magnificent use of this: as a result we have an Oblomov situation which is ruining everything. . . .[38] [Original emphasis]

In describing a web of commissions, committees and departments reminiscent of Kafka's *The Castle*, Lenin closes the letter to Tsiurupa with the emphatic, and equally prophetic declaration, the "commotion and turmoil . . . are *ruining all of us*. . . ." Indeed, within the year, Lenin himself is to suffer two serious strokes.

Further funding of the Nizhni-Novgorod Laboratory, and thus pursuit of radio research, came to the fore again early in January, 1922, when Dovgalevski requested an allocation of 50,000 gold rubles for the Laboratory. Lenin supported the application with a perfunctory accompanying note, asking that the matter be put to a vote of the Politburo (the Party executive committee), and expressing his formal confidence in the laboratory's work:

> I ask the Politburo members to take into account the exceptional importance of the Nizhni-Novgorod Radio Laboratory, the tremendous services it has already rendered and the tremendous use it can render us in the near future both in military matters and in the matter of propaganda.[39]

[38] Lenin, *PSS* 44:364-6; *CW* 35:535-7.
[39] Lenin, *PSS* 44:358; *CW* 42:387-8.

At a meeting on January 20, the Politburo considered the request and, agreeing with Lenin, approved the appropriation.

The Honor Roll of Heroes

Work in the Laboratory and on the Moscow station continued to progress during the spring of 1922 and reached a stage at which operation was imminent. A crescendo of activity is apparent in a two-week period in May during which there is an intensified flow of letters and notes between Lenin and others concerning the innovation and funding of broadcasting. A significant one in the exchange is the May 11 message to Dovgalevski, written less than two weeks before Lenin's first stroke. Its two references to America are of special interest, although it is impossible to tell what particular American radio achievements Lenin has in mind, or, indeed, whether he is speaking in specific terms at all. There is no question, though, that Lenin is disturbed by Russian slowness in the field.

I read a report in *Izvestia* today that the Nizhni-Novgorod City Council has initiated a petition to the All-Russian Central Executive Committee [i.e., Congress] to award the Nizhni-Novgorod Radio Laboratory the Order of the Red Banner of Labor and to enter the names of Professors Bonch-Bruevich and Vologdin in the Honor Roll of Heroes.

Please give me your reaction. For my part, I would consider it necessary to support this petition.

By the way, in connection with your letter to me, please inform whether you are fully satisfied with the work of the Nizhni-Novgorod Radio Laboratory. And also send me the response (as short as possible) of Bonch-Bruevich about how his work is going on the production of loud speakers capable of bringing to the broad masses what is communicated over the wireless telephone. This work has exceptionally great significance for us in view of the fact that its success, which was promised long ago by Bonch-Bruevich, would be tremendously useful for agitation and propaganda.

Therefore it is necessary to undertake any sacrifices in order to support this work. In particular, I heard that in America such work has already led to practical results.[40]

[40] Shamshur (*Lenin*, p. 149) speculates, but without proof, that Lenin might be referring to the first (still unperfected) models of electrodynamic loudspeakers.

It should be checked whether you have available for the Nizhni-Novgorod Radio Laboratory all the latest American literature on this question.

Please send your response as promptly as possible, so that I can, if necessary, sign one or another report or petition at the session of the All-Russian Central Executive Committee, which opens *tomorrow*.[41]

As Lenin mentions America twice and implicitly uses it as a gauge to assess Soviet progress, the state of radio development here at the time needs to be considered. One obvious measure is the number of stations on the air, although in 1922 the concept of "station"—or, indeed, "broadcasting"—was not settled and the definitions in use today were still being formed. The May 1, 1922, issue of the *Radio Service Bulletin* revealed 223 stations operating on 360 and 485 meters—the former wave length providing "music, concerts, lectures, etc.," and the latter, "market or weather reports." A supplementary list for May 1-12 expanded the count by 31, so that as of May 12 there were 254 stations licensed to broadcast material of general interest, in a way that ship-to-shore messages and police transmissions were not.[42] Even if the Bolshevik Revolution had been unsuccessful, it is doubtful whether a similar level of development could have existed in Russia at the time. But the Revolution's success did bring the introduction of broadcasting much closer and materially hastened its spread.

As for conditions beyond numbers, the widespread adaptation

[41] Lenin, *PSS* 54:255-6; *CW* 45:545.

[42] Department of Commerce, Bureau of Navigation, *Radio Service Bulletin*, No. 61, May 1, 1922 (Washington: Government Printing Office). The rather large number, 254, is somewhat deceptive, of course, because they were sharing two frequencies—thus not all could be on the air at any one time. Interestingly, even this figure seems to be disputed. Codding (*op. cit.*, p. 18) declares that "by May 1922 there were 129" stations, while William R. Maclaurin (*Invention and Innovation in the Radio Industry*, New York: Macmillan Co., 1949, p. 113) says that at "the end of 1922 there were 30 licensed" stations—a statement which suggests there probably were fewer in May. Neither defines "station," nor does Orrin E. Dunlap, Jr. (*Radio and Television Almanac*, New York: Harper and Bros., 1951, p. 69), who gives a figure of 80. Gleason L. Archer (*History of Radio to 1926*, New York: The American Historical Society, Inc., 1938, pp. 211, 393-7), referring to monthly bulletins of the Department of Commerce, reports that 99 "new stations" appeared in the May 1 issue and reprints a list of stations "existing in May, 1922" which totals 218. However, his derivation of the list and the figures is not clear.

of the phonograph's gooseneck horn to the radio receiver was some months in the future, so listeners were still attached to radios by the umbilical-like cord of their earphones. Work was already in progress which would allow sets to draw power from electric light circuits rather than from heavy storage batteries. Production of crystal sets was declining as manufacturers realized the vacuum tube held the most promise, especially because it permitted signal amplification. Armstrong's description of the heterodyne principle was already history (he had presented a paper about it in 1919), although it would still be a few years before receivers incorporating it would be available. Diagrams of his superregenerative circuit had appeared in newspapers and it was regarded as "the solution to all the problems of radio reception."[43] There is nothing to suggest that Lenin had heard of Armstrong's work, although it is likely it was known to engineers at the Laboratory, along with the discoveries and inventions of Langmuir, Meissner and De Forest. As to Lenin's reference to the "latest American literature," it is possible that current periodicals such as *The Electrical Journal*, *Proceedings of the Radio Club of America* and *Proceedings of the Institute of Radio Engineers* found their way to Nizhni-Novgorod as part of a shipment received there early in 1920. Several more "very valuable packages" of foreign books and journals later arrived, apparently on Lenin's orders, and according to Nikolaev "stimulated our Laboratory's research."[44] Moreover, the Ministry of Posts and Telegraphs exchanged copies of its journal for foreign publications in the field.[45]

[43] Lawrence Lessing, *Man of High Fidelity: Edwin Howard Armstrong* (Philadelphia: J. B. Lippincott Company, 1956), p. 144.

[44] Nikolaev, *op. cit.*, p. 15.

[45] Bonch-Bruevich was aware of research in Germany and England, as journals from those countries were received at Nizhni-Novgorod. Moreover, in an article published in *Telegrafia i telefonia bez provodov* in 1925, he cites a paper written by Stuart Ballantine from the December, 1924, issue of the *Proceedings of the Institute of Radio Engineers;* this confirms his knowledge of that periodical, although at a slightly later date. See Bonch-Bruevich, *op. cit.*, pp. 175, 208. The Radio Laboratory had its own library directed by Olga Zaitseva (1895-1957) who had studied English, French, German and mathematics, and who translated important articles from foreign periodicals into Russian for the radio scientists. In addition, another staff member, L. N. Saltykov (1878-1937), was linguistically proficient and had been to Germany,

(Continued on next page)

"Desirable and Proper"

It is clear, then, that Lenin was attuned, at least in general terms, to foreign developments and was conscious that the Soviet Union was not the sole locus of radio engineering progress. The May 11 letter to Dovgalevski, however, apparently contains the only specific references Lenin made to radio in the United States.

Dovgalevski replied to Lenin's letter the same day and reported he thought it "desirable and proper" to single out the Laboratory's work and the contributions of Bonch-Bruevich and Vologdin, and thus recommended approval of the City Council's petition. (The petition evidently resulted from satisfaction with reports presented to the Council on May 4 by Lebedinski, Bonch-Bruevich and Vologdin.) As to the station itself, Dovgalevski wrote that it would "be put into operation in Moscow at the beginning of June" and that he would send additional specific information about it.[46]

Two days later, May 13, Lenin spoke by phone with V. A. Pavlov (1890-1942), head of the Radio Department of the Ministry of Posts and Telegraphs.[47] Lenin's highly abbreviated notes reveal they discussed how soon the Moscow station would be in operation (in one month, said Pavlov), coverage area, as well as costs and quantities of transmitters and receivers in production.[48] Apparently the details were not totally satisfactory because Lenin again took up the matter on the 18th:

Comrade Pavlov:

I have received a report from M. A. Bonch-Bruevich. Please find out from him on the telephone what *total* sum (in pre-war rubles) would be necessary for putting the matter in good order. If it cannot [be quoted] in one figure, then preferably in not more than two (from

(Footnote continued from preceding page)
Italy, France and Holland, and in 1912 to America. He served as interpreter whenever foreign delegations visited the Laboratory (e.g., the Telefunken group in 1923) and was sent abroad often by the government, as to Stockholm, where he represented the Laboratory at the 1925 International Radio Exhibition. See Ostroumov, *op. cit.*, pp. 65-9, 176-8.

[46] Lenin, *PSS* 54:643-4.

[47] Lenin, *PSS* 45:678-9.

[48] Shamshur, *Lenin*, pp. 150-51.

–to; or *minimum* and *maximum*). Please give me your answer in a telephone message or an urgent note. . . .[49] [Original emphasis]

Bonch-Bruevich reported the following day that for normal operation the Radio Laboratory needed a firm budget of at least 7,500 pre-war rubles per month, but that a monthly maximum of 20,000 pre-war rubles would assure further development and expansion of the Laboratory.[50]

It appears that Lenin was attending to the kinds of details and plans which he hoped would be decisive in bringing broadcasting to fruition, once and for all. Armed with this information, Lenin the same day (May 19, 1922) sent a rather long letter and one short note to Stalin, newly-appointed General Secretary of the Party's Central Committee, with a "request to circulate to all members of the Politburo." In these messages, Lenin strongly endorses radio research and talks of broadcasting in terms of the wire distribution networks which eventually are to become the dominant form.

Comrade Stalin,

I am enclosing two reports. The first is by Professor Osadchi,[51] an expert on electricity, about radio-telegraph and telephone communication; the second is by Bonch-Bruevich (who is not related to the well-known Bonch-Bruevich brothers, one of whom was the Executive Secretary of the Cabinet, and the other an outstanding tsarist general). This Bonch-Bruevich, whose report I enclose, is a very outstanding worker and inventor in radio engineering and one of the principal figures at the Nizhni-Novgorod Radio Laboratory.

These reports show that it is technically quite feasible for us to transmit live human speech over any distance by wireless communications; it is also possible to put into operation many hundreds of receivers [i.e., receiving stations] that could transmit speeches, reports, and lectures delivered in Moscow to many hundreds of localities throughout the Republic, removed from Moscow by hundreds and, under certain conditions, thousands of versts.

I think that both from the standpoint of propaganda and agitation,

[49] Lenin, *PSS* 54:264.

[50] Lenin, *PSS* 54:647-8.

[51] P. S. Osadchi (1866-1943) was an electrical engineering specialist and, at that time, Deputy Chairman of the USSR Planning Commission ("Gosplan"). He was previously Chairman of the Central Electrical Engineering Council of the Supreme Council of the National Economy.

especially for those masses of the population who are illiterate, and also for transmitting lectures, it is absolutely necessary for us to carry out this plan. Considering the complete unfitness and even harmfulness of most of the bourgeois professors of social sciences whom we are tolerating, we have no other way out than to enable our few communist professors, who are capable of delivering lectures on social sciences, to deliver these lectures for hundreds of localities in all parts of the Federation.

Therefore, I think that under no circumstances should we stint funds to complete the matter of organizing radio-telephonic communication and to produce completely functional loudspeakers.

I propose that we pass a resolution to allocate, as an extraordinary measure, a sum of up to 100,000 rubles in gold from the gold fund over and above the budget to support the projects at the Nizhni-Novgorod Radio Laboratory, in order to accelerate to the maximum the completion of the projects it has begun to install completely adequate loudspeakers and many hundreds of receivers [i.e., receiving stations] throughout the Republic, which can repeat [*sic*] for the broad masses the speeches, reports and lectures delivered in Moscow or another important city.

The Council of Labor and Defense is to be charged with establishing special supervision over the expenditure of this fund and, perhaps, if it should prove expedient, to institute bonuses from the above fund for specially rapid and successful work.

Let me add that today's *Izvestia* carries a report about a British invention in the field of radio-telegraphy that transmits radio-telegrams secretly.[52] If we managed to buy this invention, radio-telephone and radio-telegraph communication would gain even more enormous significance for military purposes.[53]

The short note of the same day to Stalin apparently was prompted by Lenin's realization that proper administrative procedures had

[52] Lenin's reference is to a one-paragraph story buried at the bottom of page two of *Izvestia*, headlined "An Improvement in the Field of Radiotelegraphy" and datelined London, May 1. It announces that a British engineer had succeeded in transmitting wireless messages between London and Birmingham without their being intercepted. The *Izvestia* story proves to be an abbreviated report of a speech by a Marconi Company engineer, C. S. Franklin, to the Institute of Electrical Engineers. He revealed that messages sent by directional wireless apparatus on wave lengths of twenty meters were "comparatively secret as compared with the usual non-directional type of transmission." See *The New York Times*, May 6, 1922, p. 10.

[53] Lenin, *PSS* 45:194-5; *CW* 33:560-61.

to be followed in the funding, particularly since Lenin himself had been instrumental in introducing strict budgetary control of government agencies and government-sponsored projects a year earlier. It turned out that this message was Lenin's last concerning radio.

To Comrade Stalin:

Re today's paper by Bonch-Bruevich, I suppose that we cannot undertake to finance the Radio Laboratory from the gold fund without special authorizations.

I therefore propose charging the Council for Labor and Defense with finding out what expenditures are necessary to enable the Radio Laboratory to accelerate to the maximum the improvement and production of loudspeaking telephones and receivers [i.e., receiving stations]. This is the only thing for which we should, in my opinion, allocate a definite sum of gold over and above the budget.[54]

Three days later, May 22, the Politburo approved Lenin's proposals for continued financing of the Laboratory's experimental work and speeding the production and installation of central receivers and loudspeakers for wire networks. On the same day, Lenin conferred with Tsiurupa and A. I. Rykov (1881-1938) about the Laboratory's work and radio engineering. The conference could have touched on the Laboratory's efficiency and internal workings, its relations with the rest of the small radio industry or its role in the Soviet economy, inasmuch as Tsiurupa and Rykov were both administrative trouble-shooters. Moreover, Rykov had been head of the Supreme Council of National Economy and was to return to that post in 1923. The conversation may also have had something to do with a visit to Lenin on the same day by Boris I. Reinstein (1866-1947).[55] He was preparing for a trip to America and Lenin impressed upon him broadcasting's great significance to the Soviet Union and instructed him to enlist the help of American technical specialists.

[54] Lenin, *PSS* 45:195-6; *CW* 33:362.

[55] Lenin, *PSS* 45:680-81. Reinstein had emigrated to the United States years before, and was an American representative to the Second International in 1889. He returned to Russia in 1917, joined the Bolsheviks the following year, and later worked mainly in the Comintern and the Profintern (Red International of Labor Unions).

Lenin left Moscow for his country retreat on May 23 and had a serious stroke three days later, just about the time preparations were begun for installation of the Moscow station's new, permanent transmitting equipment. As a result of this and subsequent more serious strokes in December and in March, 1923, Lenin suffered partial paralysis of the right hand and leg as well as a speech impairment. Thus from mid-1922 until his death on January 21, 1924, Lenin's activity was extremely limited, and the introduction of radio was one of the last pieces of business he attended to before being stricken.

A Strong Voice Transmitter

Throughout the first half of 1922, Bonch-Bruevich and his colleagues at the Laboratory had been building a radiotelephone transmitter based on their designs of the previous year. Its first tests were made on the evenings of May 27 and 29 when concerts were broadcast from Nizhni-Novgorod. Additional tests, also with music for program material, were made a month later, with reception reported at distances of 700 miles. In some cities, the telephone network was plugged into a central receiver to permit diffusion via cable to subscribers, while outdoor speakers brought transmissions to crowds. The transmitter was shipped from Nizhni-Novgorod in July, 1922, and its installation on the east side of Moscow on Voznesenskaia (later Radio) Street was completed by August 15. This 30-tube transmitter, with a rated output of 12 kilowatts, was one of the strongest voice transmitters of its day.[56] Almost simultaneously, on July 25, the American Telephone and Telegraph Company had started broadcasting from WBAY in New York with 500 watts of power,[57] and most other American stations were using 100 watts or less and would be for a few years to come.

Tests in Moscow of the new equipment began August 18 and the first experimental broadcast occurred three days later. Further checks were run early the next month with the first radio concert broadcast September 17, a significant event for two additional

[56] Shamshur, *Lenin*, pp. 155-7.
[57] Banning, *op. cit.*, p. 78.

reasons. *Izvestia*, in what constituted its first radio log, had announced the concert in its September 15 edition, saying that it could be heard at 3000 meters (100 Khz). Beyond that, the small studio was discovered to be too "live," so performers and microphone had to be moved outdoors, making it perhaps the first open air concert to be broadcast in the Soviet Union. The program included compositions by Borodin, Chaikovski, Rimski-Korsakov and Glier, and a folk song. These selections, heavily weighted as to tsarist and bourgeois periods (Glier was the only contemporary), probably confirm what Trotski was later to postulate: ". . . the proletariat . . . cannot begin the construction of a new culture without absorbing and assimilating the elements of the old culture. . . . (A) new class cannot move forward without regard to the most important landmarks of the past."[58]

Although the station began operating October 27, the official opening was reserved for a special occasion, November 7, 1922, the fifth anniversary of the Revolution. At that time, it became known as "The Comintern Radio Station." The ceremonies included another concert (reviewed in *Izvestia* two days later) which was relayed to crowds not only by outdoor speakers but by a sound truck roving through Moscow streets. The station's signals were received as far away as Yugoslavia, where a technical journal reported they compared favorably in clarity and strength with transmissions from France and Germany.[59] It seems that Lenin's voice

[58] Trotski, *op. cit.*, p. 226.

[59] Sotin, *op. cit.*, pp. 400-401, 412. While broadcasting may be said to date from 1922, its subsequent maturation was rather slow. During the two following years, a major difficulty was that the Ministry of Posts and Telegraphs' network of receiving stations (which also were the hubs of wire diffusion systems) had to be shared by broadcasting as well as radiotelephone uses of a less-public character. Although the Ministry's network expanded, Sotin *(ibid.)* points out that "This type of receiving network could not . . . for very long serve the needs of radio broadcasting." Moreover, at the same time, the manufacturing of small receiving sets had not been completely organized. The "development of a genuine broadcast receiving network," Sotin *(ibid.)* reports, "can be attributed to 1924." Details about the expansion of broadcasting can be found in Alex Inkeles, *Public Opinion in Soviet Russia* (Cambridge: Harvard University Press, 1958) and Mark W. Hopkins, *Mass Media in the Soviet Union* (New York: Western Publishing Co., Inc., 1970).

was broadcast for the first time on December 8, when phonograph recordings of a speech were transmitted.[60]

The Nizhni-Novgorod Radio Laboratory was awarded the Order of the Red Banner of Labor on September 19, 1922, while Bonch-Bruevich, Vologdin and Shorin received a special expression of gratitude from the All-Russian Central Executive Committee. Additional commendation and praise for Bonch-Bruevich, Ostriakov and others came from the CLD.

The Laboratory continued its research into electronics, production techniques and numerous phases of radio wave propagation. The mid-1920s was an exceptionally busy and fruitful period. A year after the Soviet Union resumed major commercial and diplomatic relations with the West by signing the Rapallo Treaty with Germany (1922), the Laboratory was visited by representatives of the German Telefunken company, who placed an order for specimens of powerful new tubes, in exchange for certain materials not available domestically. At the same time, and continuing throughout 1924, Bonch-Bruevich and S. I. Shaposhnikov (1887-1960) were designing a small broadcasting station package with an output of 1.2 kilowatts. Its initial trials were carried out in Nizhni-Novgorod in December, 1924, while a second, improved transmitter of the same basic type began broadcasting in Moscow in February, 1925. Later, it was permanently installed at the site of one of the other Moscow stations so as to have access to its taller (492 feet) antenna mast, and the new station became known as "Little Comintern." Subsequently, the Laboratory was commissioned to build 27 more within two years, although part of those orders had to be farmed out to Moscow factories. This "Little Comintern" series was planned for installation in regions where crystal set reception of the 12-kilowatt Moscow station was impossible or where language differences proved a barrier to comprehension. By the end of 1925, six other cities were equipped with this model.[61] The largest transmitter designed and built by the Radio Laboratory had 40 kilowatts of power. This "New Comintern" was installed on Shabolovka Street on Moscow's south side

[60] Shamshur, *Lenin*, p. 158. Between 1919 and 1921, thirteen of Lenin's speeches were recorded under the auspices of the All-Russia Central Executive Committee for the Supply and Distribution of Periodicals. *CH* 29:581.

[61] Sotin, *op. cit.*, p. 404; Shamshur, *Lenin*, pp. 136-7.

and began operating in March, 1927. The following year, the Laboratory was awarded the Red Banner of Labor for the second time.

Work on Short-Wave Transmission

The Laboratory's work on short waves also was important and began with experiments in 1920. These demonstrated that transmitters of rather low power, operating around 100 meters (3 Mhz), could be heard at night at distances of 2000 miles. By 1923, Bonch-Bruevich had incorporated tubes of his own design in a 15 kilowatt transmitter operating on 96 meters whose signals were heard around the globe.[62] Further research on even shorter wave lengths yielded equipment which was used to establish reliable long-distance communication during daylight hours. Bonch-Bruevich's articles on short wave in *Radio vsem* ("Radio For Everyone") and other journals encouraged amateurs and augmented contact and exchange of ideas among these enthusiasts in the Soviet Union. Their association was formalized when the Society of Friends of Radio was established in 1924.[63] The amateurs relied heavily on basic crystal set plans devised by Shaposhnikov, issued in brochure form (several editions) by the Radio Laboratory.

Meanwhile, the Laboratory was undergoing changes prompted as much by immediate technical disputes as by the evolving nature of the Soviet economy and the direction of industrial development. Part of the local debate centered on the engineering question—whether radio's future lay in tubes or high frequency machines. But it involved as well the separate issue of the Radio Laboratory's role as a growing center of production and technical expertise and the emergence of socialist industrial policy.

Within weeks after the Revolution, a Supreme Council of National Economy (SCNE)[64] had been established to replace and absorb the unsteady and disorderly hand of workers' control of industry which resulted when the Bolsheviks took power. The new body, conceived as a central economic planning authority,

[62] Shamshur, *Pervye gody*, p. 46.

[63] *Bol'shaia Sovetskaia entsiklopediia* ["Big Soviet Encyclopedia"] (Moscow: Gosizdat BSE, 1955), Vol. 35, p. 531.

[64] SCNE had ex-officio representation on the Radio Engineering Council of the Ministry of Posts and Telegraphs.

began to install a unified administration for various industrial fields, as the World War and the Revolution had torn apart what little economic order had existed, leaving shattered, unproductive plants and workshops which would haunt the Bolsheviks far into the future. By mid-1918, the counter-revolution and the demands it was adding to factory mobilization in crucial war-related industries speeded the initiation of War Communism policies. In a sweeping decree of June 28, the Cabinet nationalized all important industrial sectors, among which was the electrical, and charged SCNE with their administration as soon as that agency would promulgate specific regulations. The transfer of *ownership* to the state was to proceed furthest in the electrical, transport, engineering, chemical, textile and paper industries.[65] The actual fact of *administering* these industries along socialist lines was confronted in a series of decrees from mid-1918 to the end of 1919. These aimed at structuring each sector into unions or trusts—a program advocated by Lenin since 1917 so as to bring about that last stage of capitalist development necessary for the take-off into socialist policies. Each trust was to be responsible to SCNE as far as economic and management policies were concerned—a system of severe centralization designed to match the severe war threats, while moving the country along what was felt to be its historically inevitable path.

By the end of 1920, with the World War and Civil War concluded, the programs of War Communism were reviewed to take account more of long-range developments than spur-of-the-moment emergencies. The paralysis which gripped the country, aside from massive agricultural problems, involved declining industrial production, decayed and destroyed plants, disintegration of the urban labor force and a widespread breakdown of the fundamental kinds of system-order required by modern countries. The cure was embodied in a series of programs which emerged throughout 1921 as the New Economic Policy. But NEP was more than just the revision of policies dictated by the war; it was also a determined attempt to complete industrialization in a country in which bourgeois capitalism had not yet been able to flourish. This, Lenin believed, was a necessary condition for the emergence of socialism and could be brought about by a period of state capitalism and

[65] Carr, *op. cit.*, 2:178-9.

by acknowledging that *"there is still much that can and should be learned from the capitalist."*[66]

NEP's application to industry was spelled out by directives from a party conference in May, 1921, and a Cabinet decree in August of the same year. These called for strengthening the consumer goods component of industry and for concentrating production into trusts, but divorced from SCNE's direct control over management. Trusts became responsible for their own profit-loss record and acquired the ability to buy and sell on the open market, giving up their sheltered position as state wards. These were attempts to remedy the extreme centralization dictated under War Communism.

Within a year more than 400 trusts had been established, of which 20 were in the electrical field.[67] The trust had become the dominant industrial structure, and the radio industry as part of the economy was inevitably swept along and influenced by national policy.

On the initiative of V. V. Kuibyshev (1888-1935), a prominent Bolshevik then engaged in economic work, the Low-Current Factories Trust was founded January 1, 1922, bringing together eleven companies—some small, evidently, some large.[68] A side effect of NEP in this field was the establishment not only of a purely commercial relationship between the Trust and the Ministry of Posts and Telegraphs, but a competitive one as well because the Trust developed and produced a transmitter slightly more powerful than the Radio Laboratory's 1.2 kilowatt "Little Comintern" model.[69]

Vologdin was invited to become a board member of the Trust, as he was not only a scientist and inventor but somewhat of an expert on factory production methods. Vologdin accepted the post but did not actually leave the Radio Laboratory until late 1923, the same year in which Shorin was appointed director of the

[66] Lenin, "O prodovol'stvennom naloge" ["The Tax in Kind"], *PSS* 43:232; *CW* 32:353. Original emphasis.

[67] Carr, *op. cit.*, 2:306-7.

[68] Ostroumov, *op. cit.*, p. 57.

[69] Sotin, *op. cit.*, p. 404. It seems that one source of delay in constructing the Moscow station involved manufacturing difficulties at the Trust's factories which were supplying certain electrical parts to the Laboratory. See Shamshur, *Lenin*, p. 143.

Trust's Radio Department. Simultaneously, there was a significant reorganization of the Laboratory which saw Nikolaev siding with proponents of the tube in what evidently was a scientific power struggle against advocates of the high frequency machine. The latter were transferred to Petrograd (now Leningrad) to work in the Trust's laboratory, and Bonch-Bruevich became head of the Nizhni-Novgorod operation.

Another factor in the split involved the relation of pure research to both the Ministry of Posts and Telegraphs and the rest of the emerging radio industry. The Nizhni-Novgorod unit continued to function as the main research and production support arm for the Ministry, while the Trust's work was construed in much larger terms, encompassing applied research, production of radio apparatus and consumer products, and commercial contacts with foreign countries. Indeed, the Trust signed a contract with a French corporation which was to provide plans, materials and know-how in an attempt to stimulate modern production. Ostriakov was part of a group which spoke out against this and tried to stop it, on the grounds that the agreement would encourage penetration by foreign capital and control—as well as introducing new nomenclature and incompatible foreign parts—and thus to be harmful in the long run to Soviet radio engineering.[70] Moreover, the Trust, apparently at the insistence of the French corporation, planned to develop a long-distance communication system based on high frequency machines and long waves. Bonch-Bruevich fought against this, urging reliance upon tubes and short waves which his research had demonstrated to be feasible.

Relations between the Laboratory and the radio industry were colored by other matters as well. Lenin's stroke in mid-1922 and his subsequent inactivity had ushered in a period of administrative shake-ups and assertions of power. In 1923, former Red Army commissar I. N. Smirnov (1881-1936), a critic of the Laboratory, was appointed Minister of Posts and Telegraphs, while Dovgalevski was demoted to Deputy. In 1924, both Dovgalevski and Nikolaev (the Laboratory's constant patron) were transferred to diplomatic and trade missions abroad, where they were to spend the

[70] In the aftermath, Ostriakov was given an assignment to develop communications in far-off Yakutia (central Siberia), where he spent the next year or two. See Ostroumov, *op. cit.*, pp. 140-41.

next several years. At the same time, the encouragement given by the market to light consumer production at the expense of heavy industry added another aspect to friction between the Trust and the Laboratory. The latter was producing utility models of apparatus at cost for the Ministry, but the Trust, concerned by the commercial market from which its profits came, evidently found these totally unsatisfactory for mass production.[71] The situation was intensified by a Cabinet decree of July 28, 1924, which authorized organizations and private persons to own receivers, thereby stimulating demand.[72] The Trust began production of two small models for consumers, and eventually a third was added with tubes and loudspeakers for clubs and theaters, but quantity was insufficient and a shortage of receivers arose by 1925.[73]

Both the Trust and SCNE urged that the Radio Laboratory be transferred from the Ministry of Posts and Telegraphs to the scientific-technical section of SCNE so as to make it more broadly responsive to national interests. This was seen as conforming to a pattern in which other research institutes had been brought under SCNE's authority. The change was carried out in 1925, and Dzerzhinski, then head of SCNE, assured the Ministry that the shift would not be detrimental, as the new arrangement would continue to allow the Laboratory to fulfill assignments from Posts and Telegraphs.

Further efforts to centralize and concentrate the radio hardware industry led to additional administrative and structural changes. From the standpoint of production capacity, the Radio Laboratory was a small unit and was not suited to satisfying growing demands for radio apparatus. In terms of the rationalization of industry, it

[71] Ostroumov, *op. cit.*, p. 33.

[72] The decree, Article 40 on "Private Radio Receiving Stations," formalized ownership by instituting a license system for purchased and home-made receivers. According to the measure's preamble, the action was justified "for economic, scientific, and cultural needs and for facilitating the development of the radio industry, and cultivating radio engineering knowledge in the country." Article 41, also of July 28, established a temporary schedule of license fees. Details in *Sobranie zakonov i rasporiazhenii Raboche-krest'ianskogo pravitel'stva SSSR* ["Collection of Laws and Decrees of the Worker Peasant Government of the USSR"] (Moscow: Upravlenie delami Sovnarkoma SSSR), No. 3, September 22, 1924, pp. 44-46, p. 46.

[73] Sotin, *op. cit.*, p. 413.

made more sense to eliminate the autonomous structure of that unit by merging it with others in the same field. The Trust's proposal for a consolidation in Leningrad was adopted and the staff of the Nizhni-Novgorod organization moved there in 1928, becoming part of the Central Radio Laboratory which had already absorbed researchers from the Kazan base.[74] While this shift certainly involved industrial centralization, it could also have figured in a plan to rehabilitate Leningrad, not only the Trust's location but a city associated with the metals industry. In 1925, an SCNE commission outlined a five-year industrial development program for that city, whose factories had suffered considerably during an extended period of paralysis. The commission's plan, which emphasized special expansion of the electrical and engineering industries, was "a landmark in the revival of Soviet heavy industry and in the resuscitation of Leningrad."[75]

Bonch-Bruevich Downgraded

In 1928, *Telegrafia i telefonia bez provodov*, which had been published for almost ten years at Nizhni-Novgorod under Lebedinski's editorship, also was transferred to Leningrad. After some name changes, it emerged as *Izvestia elektrotekhnicheskoi slabotochnoi promyshlennosti* ("News of the Electrical Engineering Low-Current Industry"—indicative of the field stressed by the Trust). Earlier, the scholarly Lebedinski, a proponent of the tube, had been given an official reprimand by Smirnov. Bonch-Bruevich, whose counter-proposal for consolidation in Moscow had been

[74] In selecting a site to which the Tver laboratory could be moved in 1918, Nikolaev and his colleagues had wanted "to develop the matter somewhat farther from Moscow so that the SCNE would not 'centralize' us." See Nikolaev, *op. cit.*, pp. 9-10. As it turned out, the choice of Nizhni-Novgorod did provide the kind of insulation they desired for the next several years. But eventually the feared "centralization" and tighter control by Moscow and the Party started to come about in the mid-1920s, when Stalin began using his party secretary's post to place his supporters in important positions in the Party and government apparatus around the country. One example of this was the appointment in 1924 of "hard-liner" A. A. Zhdanov (1896-1948) as party chief of Nizhni-Novgorod, where he was to be in charge for the next ten years, before moving up to a position as one of the most prominent of the Stalinist national leaders.

[75] Edward H. Carr, *Socialism in One Country* (Baltimore: Penguin Books, 1970), Vol. 1, p. 370.

rejected, became head of research in the Central Laboratory. Nonetheless, he found himself in an organization where pure research was made subordinate to the immediate production problems of the Trust.[76] This tenuous relationship came to the fore early in 1931 when Bonch-Bruevich was relieved of his post at the Central Laboratory. New leadership was installed to attend to manufacturing difficulties while research projects were cut back. Bonch-Bruevich rejoined the Ministry of Posts and Telegraphs to continue his work, and until his death in 1940 spent most of his time teaching and writing.

Running parallel to these industrial conflicts, and inevitably influenced by economic dilemmas and their solutions, the broadcasting system was developing in the Soviet Union. At the end of 1924, in the wake of the trust-building era, the government formed the Radio Transmission Corporation, giving it the responsibility for broadcasting, the building of stations and the sale, installation and repair of receivers. However, without its own technical support arm, the Corporation's activities gradually reduced themselves to using already existing transmitters while its other functions continued to be handled by the Ministry of Posts and Telegraphs and various government agencies. It was dissolved in 1928 and broadcasting was returned to the Ministry of Posts and Telegraphs with immediate supervision entrusted to the Central Radio Council which drew up a five-year plan.[77]

As far as reception was concerned, development occurred along two paths. One centered on individual and club ownership of radio receivers, and this grew in spite of economic and manufacturing difficulties. The other, the system of private and public speakers wired to a central receiver, gained prominence in the 1920s. This method not only hastened the spread of radio reception but was relatively cheap and simple, since each outlet required nothing more than a speaker hook-up and made the most of scarce resources. It was unquestionably democratic and egalitarian in Soviet terms, for it made transmissions accessible to large numbers who, because of poverty, location or language, might otherwise have been deprived. Moreover, when used outdoors, it was a logical extension of the publicly-posted news bulletin.

[76] Ostroumov, *op. cit.*, p. 38.
[77] Sotin, *op. cit.*, pp. 404-5.

Development of a satisfactory loudspeaker, the last element in the system, was achieved in the early 1920s and thus permitted group listening to replace individual listening which earphones had made mandatory. In its time, the loudspeaker was truly a miraculous device for it liberated the listener from an annoying head set and permitted an entire hall of people to hear a transmission from one receiver. In so doing, it allowed radio to turn from point-to-point communication into a medium of popular diffusion. Nikolaev recollects that Lenin was especially enthusiastic about loudspeaker development, saying "At least we could begin with a small room where it would be possible to hear the voice without earphones."[78]

Shorin, later one of the inventors of Soviet sound film, designed speakers and amplifiers that were put in use at the Twelfth Communist Party Congress (April, 1923), which Lenin, ironically enough, was unable to attend because of illness. The next month they were used successfully outdoors in Moscow to diffuse concerts transmitted by the local radio station. These models apparently provided the positive results necessary to start production, and the first shipments of speakers left the facilities of the Low-Current Factories Trust in January, 1924, just as Lenin had died.[79]

The initial steps which eventually contributed to wire network proliferation were conducted by the Moscow City Council of Labor Unions in 1925. A high-power amplifier was installed in the House of Unions and from it, as spokes in a wheel, five main lines went to the edges of the city. Branches from these lines terminated in private homes and public places such as clubs, schools, factories and parks, eventually adding up to 12,000 loudspeaker points. Similar networks were set up elsewhere by radio enthusiasts in clubs and factories.[80]

* * *

THERE ARE SOME important aspects of the innovation and expansion of Soviet broadcasting which in the limitations of this report can only be suggested. The growth of the consumer radio industry, for instance, needs to be examined against

[78] Nikolaev, *op. cit.*, p. 17.
[79] Shamshur, *Lenin*, pp. 148-9.
[80] Sotin, *op. cit.*, p. 413.

the competing forces of radiofication and investment in heavy industry, policies affected by the agendas of War Communism, NEP and subsequent five-year plans. Moreover, the rate of proliferation of small receivers for individual and club use must be seen as the outcome of decisions which had to take account of the practicality and simplicity of wire diffusion systems and the general economic health of the nation. To a great extent, the spread of broadcasting (transmission and reception) was dependent upon the objective nature—geographic, cultural and economic—of the Soviet Union. The Russian empire had been a poor, backward nation; the Bolsheviks inherited that, as well as encountering problems of a rapid and painful change to a new social order. Radiofication's expense—literally and figuratively—had to be measured in national terms, at a time of severe shortages even in the basics. The system's development had to compete against urgent needs for raw materials, capital and manpower. Poverty, and the demands other spheres placed on productive powers and resources, enhanced the logic of wire networks. At the same time, there was an emphasis on construction of relatively few but powerful stations. The eventual shape of broadcasting and the consumer radio industry also was molded by men, of course. While Lenin initially had a great deal to do with decisions of the kind implied here, radio's maturation after mid-1922 was independent of his influence, and paralleled the rise of Stalin and the assertion of monolithic Party control of all aspects of Soviet life.

A second factor implied throughout the article is Lenin's bias toward technology and his belief in its curative powers. This is, however, but part of a large complex of thoughts and assumptions whose historical roots can only be sketched here. It is often overlooked that Lenin, as a Bolshevik and a Marxist, inherited a considerable share of western liberalism's belief in rationalism, progress, dynamism and salvation by the machine. Technology, unleashed by the bourgeoisie, was felt to be a force for unlocking productive energies which could turn Russia into a modern nation without—thanks to Bolshevism—the exploitation inflicted by private ownership. The attention to radio's introduction, then, reflected an already-favorable attitude toward improvement and science. The acceptance of the machine and the desirable trends it was thought to put into motion was, therefore, as much a char-

acteristic of bourgeois capitalism as of "scientific socialism." Trotski acknowledged this in 1924: "The passion for mechanical improvements, as in America, will accompany the first stage of every new Socialist society."[81] Indeed, Bolshevism wholeheartedly absorbed Marx's endorsement of science and dynamism, and sought to carry them to their fulfillment.

A third factor, and in many ways the most compelling and intriguing, is the relationship between the ideology of Bolshevism and its prescriptive points of view toward radio specifically, and communication in general.[82] A discussion of this traditionally begins with Lenin's declaration in *Where to Begin*[83] (May, 1901) that "A newspaper is not only a collective propagandist and a collective agitator, it is also a collective organizer." His position on the press, however, is found in writings earlier than 1901. It emerged during a period of absolutism in Russia, while the revolutionary movement was distinguished by its lack of unity, and when the newspaper *Iskra* had to be published abroad and smuggled into Russia. Later, Lenin applied this same view to broadcasting, which he called a "newspaper without paper," when he wrote that radio would be useful for propaganda and agitation. He saw in broadcasting a medium for informing and educating illiterate masses, and in these terms it became a force to be harnessed for national development. These are broad specifications, though, and whether they were to apply only to Party writings, or to art and communication in general, needs further clarification. Indeed, the Soviet policy on proletarian culture and art (which inevitably involves communication) continues to evolve to the present day. Much simpler was the matter of ownership, whose public character was settled by the Revolution's success. As Lenin wrote in November, 1917, "freedom of the press means liberation of the press from the oppression of capital. . . ."[84] Beyond that, Lenin hoped broadcasting would provide a basis for joining the country to the city and the peasantry to the proletariat. In a very pragmatic sense,

[81] Trotski, *op. cit.*, p. 253.

[82] It is anticipated that this can be explored as part of a larger study of socialist thought being developed by T. H. Guback.

[83] Lenin, "S chego nachat'" ["Where To Begin"], *PSS* 5:1-13; *CW* 5:17-24.

[84] Lenin, "Proekt rezoliutsii o svobode pechati" ["Draft Resolution on Freedom of the Press"], *PSS* 35:51; *CW* 26:283.

the new regime needed peasants' support, physically and materially, and they had to be convinced their best interests lay with the Soviets. Aside from that, radio was believed to be an instrument which could help level the difference between rural and urban peoples, and foster their economic, cultural and intellectual linkage.

Although Soviet broadcasting was innovated in 1922, its evolution was modest. A decade after the Revolution, Trotski was to write: "Statistics unmercifully reveal our backwardness in the field of technique and especially regarding the radio. But they also give us a picture of the importance the radio can and must have as the cheapest means of communication in our enormous country."[85]

[85] New York *Times*, November 6, 1927, Section 10, p. 13.